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**Published:**

— with international search report

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

## LOOKING UP A NETWORK RESOURCE LOCATION

This invention relates to looking up a network resource location.

5 In the case of the World Wide Web, the network resource location can be identified by a Uniform Resource Locator (URL). On-line search engines enable a user to locate URLs of web sites that relate to keywords of a search strategy that are entered by the user through a keyboard. For example, to retrieve information about airline reservations, a user may search for the keywords "airline" and "reservation".

## 10 SUMMARY

In general, in one aspect, the invention features a method of looking up a network resource location by receiving audio information identifying the network resource location from a user over a communication line, retrieving a network resource location based on the audio information; and  
15 conveying the network resource location to the caller.

Implementations of the invention may include one or more of the following features. The network resource location may include a URL of a web page. The communication line may include a telephone channel. The audio information may include at least one of voice information and  
20 touch-tone information. The network resource location may be conveyed to the user as voice information. The URL may be conveyed as an email message addressed to the user. The email message may contain a rating corresponding to the URL. The email message may contain a second network resource location at which the user can rate the network resource  
25 location. The network resource location may be conveyed as an HTML redirect command to a web browser associated with the user. The network resource location may be retrieved from a search tool. The network resource location may be retrieved as a link displayed on a web page, and

the voice information may be generated by clicking on the link. The audio information may include a keyword associated with information being sought. The audio information may include a company name. The user may be prompted to submit a search keyword, prior to retrieving the network resource location, the network resource location being retrieved based on the search keyword.

In general, in another aspect, the invention features a service for looking up a network resource location. The service includes a search tool to perform a search based on audio information received from a user on a communication line, the search tool retrieving the network resource location; and a presenter to present the network resource location to the caller.

Implementations of the invention may include one or more of the following features. A first operator may prepare the search based on the audio information. A reference operator may prepare the search, with the first operator routing the audio information to the reference operator when the first operator cannot prepare a successful search. The presenter may include a player for playing a voice message corresponding to the network resource location. The player may play the voice message on a telephone line.

Among the advantages of the invention may be one or more of the following: The user can get a URL for a company quickly and easily and from any place in the world that is accessible to a telephone. Thus, for a user who has a thin browser running on a portable device, the URL can be gotten without a lot of tedious searching. For any user, even one working on a desktop computer with a wired telephone, the service provides a quick and easy way to get a URL without requiring tedious queries to a conventional search engine. For certain users, the ability to automatically connect to the URL will be available.

Other features and advantages will be apparent from the description and the claims.

## DESCRIPTION

FIG. 1 is a block diagram showing a URL lookup service;

5     FIG. 2 is a flow chart showing the procedure used by the service of FIG. 1 to lookup a URL;

FIGS. 3, 4, and 5 show electronic mail messages.

As shown in figure 1, in one implementation of the invention, a user (not shown) has a cellular phone 12 and a personal digital assistant device  
10     ("PDA") 14 that has access to a network (also not shown) such as the Internet, e.g., through a modem 16 contained within the PDA 14. The user may view information using web browser software 18 on the PDA. The user may also send and receive email using email software 20 on the PDA. The user enters information onto the PDA 14 using an input subsystem 22.  
15     such as a miniature keyboard or a stylus on a touch-sensitive display. Suppose the user is interested in looking at the General Electric's recruiting website but does not know the URL. In some implementations of the invention, to lookup the URL, the user places a call on the cellular phone 12 to a national, pay per call telephone number 30 associated with a  
20     URL lookup service 31. After the service answers the call, the user says "General Electric recruiting" to create a spoken request 38. An operator station 32 that is part of the lookup service 31 receives the spoken request 38 for processing. Operator station 32 is a computer or a network of computers that is used by one or more human operators (not shown) to  
25     lookup URLs. Operator station 32 includes a recorder 36 for recording the spoken request 38, a web browser 42 for viewing web pages and submitting searches, and a search tool 40 for performing searches. Operator station 32 also includes a speech synthesizer 44 for delivering

audio information in a human voice back to the user, email software 46 for sending information by email, and a hypertext markup language ("HTML") redirect command generator 50 for redirecting a web browser to a URL of interest.

- 5 Operator station 32 also includes a database 33 (to be added to the figure) in which are stored a large number of relationships between, for example, company names and URLs. For example, one entry in the database would have the URL "www.gecareers.com" associated with the request phase "general electric recruiting." The database would be built up over time  
10 and maintained in an updated state by entries made continually by human operators as a result of their interaction with users.

The search for the URL in response to a spoken request can be done in several ways, either automatically or manually.

- In one method for responding, the human operator listens to the spoken  
15 request and undertakes a search for the URL, either by searching in the database or by using a search engine to search the World Wide Web, in either case through a web browser interface 42. The search is submitted to the search tool 40, which performs the search and generates a web page containing the relevant URL. The web page, which is presented on a  
20 web browser 42, includes a link that the human operator clicks to play a synthesized human voice speaking the URL back to the user using the synthesizer 44. The operator also uses email software 46 to send the retrieved URL to the user by email over the network interface 48. If the user has the web browser 18 open on the PDA 14, the HTML redirect  
25 generator 50 may also redirect the web browser 18 to the retrieved URL by generating an HTML redirect command and sending it to the web browser 18 through the network interface 48.

In some cases, the operator station may locate the URL automatically by performing speech recognition on the spoken request to derive the words contained in the request, then automatically forming a query to the database using the recognized words. If the query is successful, the speech synthesizer could automatically be caused to speak the URL back to the user and send the associated email message.

In some cases, locating the desired URL manually may be difficult. Lookup service 31 also includes a reference operator station 49 that is manned by a reference operator. The reference operator performs more involved searches when the first search by the operator station 32 does not yield the correct URL.

Thus, as shown in figure 2, the process begins when a user calls a telephone number associated with a URL lookup service (200). The recorder 36 starts recording the user's speech (202) and the synthesizer 44 plays an automated message requesting the user to spell the user's email address (204). After the user spells his email address (206), synthesizer 44 prompts the user to select a service option by pressing a key on the cellular phone 12 (208). The user may press a "1" key to retrieve a URL associated with a company of interest and a "2" key to search for a URL using a keyword. Information about the key pressed by the user is transmitted over the telephone connection 34 and detected by the operator station 32 as touch-tones that are uniquely associated with corresponding keys on the cellular telephone 12. The operator station 32 then checks if the user pressed the "1" key (210). If the user did not press the "1" key, the operator station proceeds to check whether the user selected the "2" key (211).

If the user pressed the "1" key, synthesizer 44 requests the user to say the name of a company whose URL the user would like to retrieve (212). In the example discussed earlier, after the user says the name of the company

(214), the information recorded by recorder 36 is routed to the human operator. The operator plays the recording (216) and prepares a search query on the web browser 42 for the company name (by company name we mean any information that would identify the company or one of its  
5 websites in a way that would permit a search).. The operator then submits the company name to the search tool 40 (218) and checks if the search tool has located any URLs related to the company name (220). If no URLs have been located, the operator proceeds to request a search category from the user (213) in preparation for a keyword search (described below).

10 Otherwise, if a URL has been located, the operator plays the search result on synthesizer 44 (by clicking on a link as previously described) so that the user can hear the URL on the cellular phone 12 (224). The operator then plays the previously recorded email address (224) and sends the URL associated with the company name to that email address (228) so that the  
15 user may access the URL using email software 20 on PDA 14. HTML redirect generator 50 generates an HTML redirect command, which it sends to web browser 18 using network interface 48, causing web browser 18 to automatically load the information associated with the URL (230). The redirect generator is able to send the information to the web browser  
20 18 because the user of the PDA will have logged into or possess a key to gain access to a central search website. Once the user has logged in to that site, there will be a temporary connection file where the information on the PDA IP address and web browser will be stored. The operator station routes the requested information in an HTML format to the temporary IP  
25 address.

Returning to an earlier step, if the user did not press the "1" key, the operator station 32 determines whether the user pressed the "2" key. If the user did not press the "2" key, the operator station 32 allows the user to perform other functions (240), such as retrieving a billing history for using  
30 the URL locator service or subscribing for the locator service.



If the user pressed the "2" key, a keyword search is performed by the operator. The synthesizer 44 asks the user to speak a category or keywords of URLs that the user is interested in (213). For example, a user who would like to purchase an airline ticket might say "airline ticket  
5 purchase," to indicate that the user would a URL of a web page where the user can purchase airline tickets. After the user has stated a search category, the recording is forwarded to an operator who plays back the recorded search category (217) and prepares a search for the highest rated web sites within the category using web browser 42. The operator submits  
10 the prepare search to the search tool 40 (219), which lists the search results. The operator then checks whether the search has located any URL search results (221). If the search has located results, the operator conveys the results to the user (222, 224, 228, 230), as previously described.

Otherwise, if the search has not located any URLs, the recording of the  
15 search category and the user email address is routed to a reference operator 48 to perform a more comprehensive search (223). The operator then informs the user that a corresponding URL has not been retrieved (225) and that the URL lookup has been forwarded to reference operator for a more comprehensive search. The reference operator performs the  
20 search (227) and sends the results of the search to the user by email (228) within an hour of the users call.

As shown in FIG. 3, results from a lookup of a URL in a category "airline ticket reservation" are sent as an email message 300 to a user email address 302 from an email address 304 associated with the lookup service.  
25 The email message 300 includes two URLs 306, 308 from the category 320 selected by the user, although the email software 46 of the operator station 32 may be configured to transmit only one URL instead. The email message 300 further includes user-preference rating information 307, 309 about the two URLs. The email message further contains rating  
30 URLs 310, 312 that the user can use to rate the usefulness of the URLs

306, 307 in the search category 320. The user can view a more detailed search report by clicking on a URL 314 or review the results of his past URL searches by clicking a URL 316, both of which are also contained within the email message 300.

5 As shown in figure 4, an email message 400 sent to a user after a failed search includes a first segment 402 that informs the user that the search for a URL in the search category 403 did not yield any results and presents a search URL 404 that the user can click on to modify and resubmit the search. A second segment 405 of the email message informs the user that  
10 he has not been charged for the unsuccessful search, while a third segment 407 allows the user to view the results of previous searches by the user.

As shown in Fig. 5, an email message 500 sent to a user that has not subscribed to the lookup service contains a URL 502 that the user can use to subscribe to the lookup service. The email message also contains  
15 another URL 504 that is the result of a company name search for "General Electric Company" along with ratings 506 for the URL 504.

Users of the 411 service may sign up free at a web site such as www.why.com. In addition to the ability to rate and review websites, 411 users will have a section of the site in their profile sections dedicated to  
20 411 activity and usage. URL's from previous calls will automatically be categorized and prioritized based upon the ratings and categories of the why.com site. All prior URL requests will be available for members only. Storage, categorization, and prioritization of URL's will begin only after a 411 user becomes a why.com member. Previous requests prior to  
25 becoming a member will not be stored.

Other embodiments are within the scope of the following claims.

Other formats may be used to transmit the request 38 (FIG. 1) from the cellular phone 12 to the lookup service. The information may be

submitted by touch-tones that are generated by pressing keys on the cellular phone that spell out the lookup information, e.g., the name of the company. Alternatively, the touch-tones may be generated by the modem or some other component contained within the PDA.

- 5     The request can be made from any phone or other voice-based communication system, not only from a cellular phone. The email and web browser of the user may be running on a desktop computer or any other device capable of running email and browsers, including cellular telephones and laptop computers.

10

**CLAIMS**

- 1     1. A method of looking up a network resource location comprising:  
2         receiving audio information identifying the network resource  
3         location from a user over a communication line;  
4         retrieving a network resource location based on the audio  
5         information; and  
6         conveying the network resource location to the caller.
- 7     2. The method of claim 1 in which the network resource location  
8         comprises a URL of a webpage.
- 1     3. The method of claim 1 in which the communication line comprises a  
2         telephone channel,
- 1     4. The method of claim 1 wherein the audio information includes at least  
2         one of voice information and touch-tone information.
- 1     5. The method of claim 1 wherein the network resource location is  
2         conveyed to the user as voice information.
- 1     6. The method of claim 1 wherein the first URL is conveyed as an email  
2         message addressed to the user.
- 1     7. The method of claim 6 wherein the email message contains a rating  
2         corresponding to the URL.
- 1     8. The method of claim 6 wherein the email message contains a second  
2         network resource location at which the the user can rate the network  
3         resource location.
- 1     9. The method of claim 1 wherein the network resource location is  
2         conveyed as an HTML redirect command to a web browser associated  
3         with the user.

- 1 10. The method of claim 1 wherein the network resource location is  
2 retrieved from a search tool.
- 1 11. The method of claim 5 wherein the network resource location is  
2 retrieved as a link displayed on a web page and the voice information  
3 is generated by clicking on the link.
- 1 12. The method of claim 1 wherein the audio information includes a  
2 keyword associated with information being sought.
- 1 13. The method of claim 1 wherein the audio information includes a  
2 company name.
- 1 14. The method of claim 13 further comprising prompting the user to  
2 submit a search keyword, prior to retrieving the network resource  
3 location, the network resource location being retrieved based on the  
4 search keyword.
- 1 15. A service for looking up a network resource location, comprising:  
2 a search tool to perform a search based on audio information  
3 received from a user on a communication line, the search tool  
4 retrieving the network resource location; and  
5 a presenter to present the network resource location to the caller.
- 1 16. The service of claim 15 further comprising:  
2 a first operator to prepare the search based on the audio  
3 information.
- 1 17. The service of claim 15 further comprising:  
2 a reference operator to prepare a search, the first operator routing  
3 the audio information to the reference operator when the first operator  
4 cannot prepare a successful search.

- 1 18. The service of claim15 wherein the presenter includes a player for  
2 playing a voice message corresponding to the network resource  
3 location.
- 1 19. The service of claim18 wherein the player plays the voice message on  
2 a telephone line.
- 1 20. The service of claim15 wherein the presenter includes an HTML  
2 redirect generator for sending an HTML redirect command to a web  
3 browser associated with the caller.
- 1 21. The service of claim15 wherein the URL presenter includes email  
2 software for sending the first URL to the caller in an email message.
- 1 22. The service of claim21 wherein the email message contains a rating of  
2 the network resource location.
- 1 23. The service of claim 21, wherein the email message contains a second  
2 network resource location that allows the caller to rate the first  
3 network resource location.

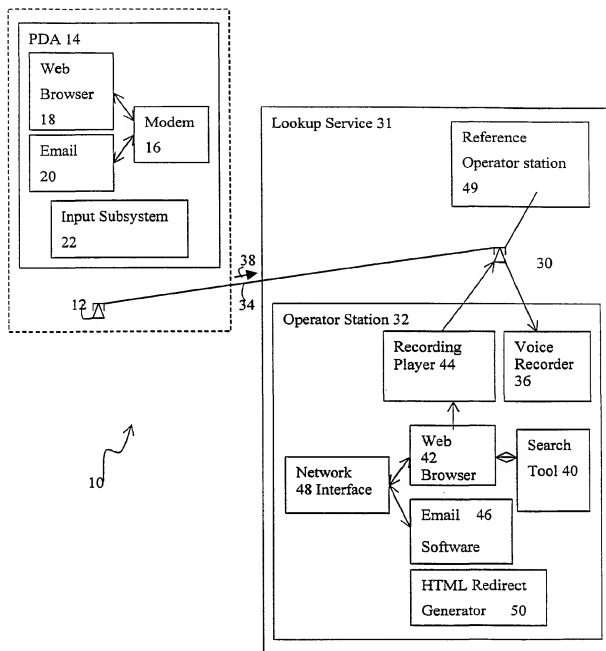
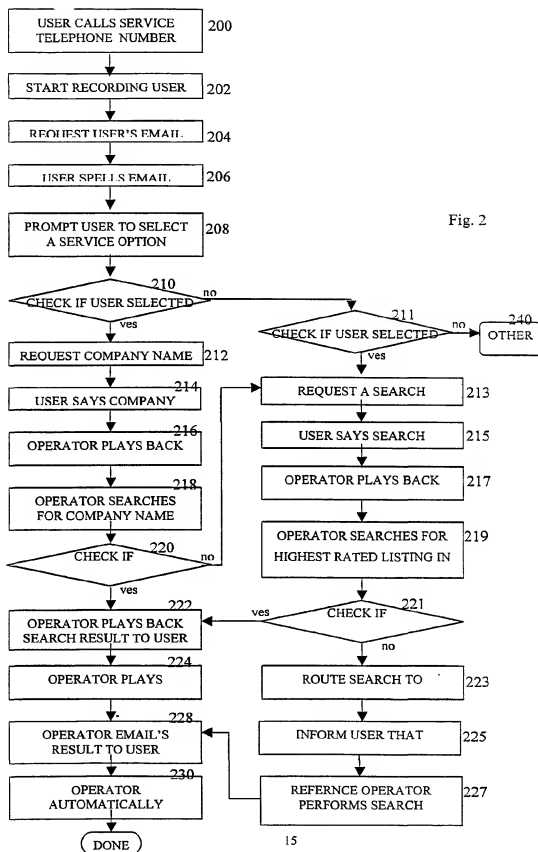


Fig. 1





**From:** [results@why.com](mailto:results@why.com) 304  
**To:** [caller@somewhere.com](mailto:caller@somewhere.com) 302  
**Subject:** Search results for "airline ticket reservation"  
320

5 The URLs that match "airline ticket reservation" are:

306 <http://www.expedia.com> rating 97% 307

308 <http://www.sabre.com> rating 97% 309

10

You may submit a rating for the site at the URL below:

<http://ratings.why.com/user89-www.expedia.com> 310

15 <http://ratings.why.com/user89-www.sabre.com> 312

You can view a more detailed report of your search that includes more listings at

20

314 <http://results.why.com/searchNo1234567>

A history of your past searches is available on your personal why.com web page at:

25

316 <http://personal.why.com/user89>

300

30

Fig. 3

**From:** results@why.com  
**To:** user@somewhere.com  
**Subject:** Search for "Pink Elephant" unsuccessful  
403

5 We regret to inform you that the search for "Pink Elephant" did not yield any results. You may modify and resubmit your search that:

10 <http://results.why.com/searchNo1234567> 404

You have not been charged for the unsuccessful search 405

15 A history of your past searches and results can be found on your personal why.com web page at:

20 <http://personal.why.com/user89>

Fig. 4

25

**From:** results@why.com  
**To:** newuser@somewhere.com  
**Subject:** Search results for "General Electric Company"

5 The URL for "General Electric Company" is:

504 [http://www.ge.com\\_rating](http://www.ge.com_rating) 94% 508  
You may submit a rating for the site at the URL below:

10 <http://ratings.why.com/user89-www.ge.com>

You can view a more detailed report of your search at

15 <http://results.why.com/searchNo1234567>

Why.com provides a variety of privileges to subscribed members, including a personal search history page. You may subscribe to why.com at the url below.

20 <http://subscribe.why.com?newuser@somewhere.com>  
502

25 500

Fig. 5

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US01/40725

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(7) : H04N 7/15

US CL. : 709/220, 224; 348/14, 15, 16

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 709/220, 224; 348/14, 15, 16

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
Microsoft computer dictionary

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

STN, IEEE, WEST

Search terms: look up, audio, network resource, URL, email, HTML, cellular phone, webpage, rating, keyword

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,710,591 A (BRUNO et al) 20 January 1998, abstract, fig.1, col.4 line 44 to col.5 line 67, col.7 line 27 to col.8 line 50.	1-23
Y, P	US 6,161,139 A (WIN et al) 12 December 2000, abstract, fig.2, col.5 line 12 to col.6 line 44, col.7 line 14 to col.8 line 61.	1-23
A	US 5,754,938 A (HERZ et al) 19 May 1998, col.8 line 43 to col.10 line 63 and col.28 line 44 to col.29 line 38.	1-23

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

## \* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

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\*T

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

\*X

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

\*Y

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

\*G

document member of the same patent family

Date of the actual completion of the international search

28 JUNE 2001

Date of mailing of the international search report

02 AUG 2001

Name and mailing address of the ISA/US

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